DOCUMENT RESUME

ED 412 118 SE 060 673

AUTHOR Bainer, Deborah L.; Cantrell, Diane; Barron, Pat
TITLE Professional Development of Environmental Educators through Partnerships.
SPONS AGENCY Eisenhower Program for Mathematics and Science Education (ED), Washington, DC.
PUB DATE 1997-08-00
NOTE 31p.; Paper presented at the Annual Meeting of the North American Association for Environmental Education (Vancouver, British Columbia, Canada, August 15-19, 1997).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Communication Skills; *Educational Cooperation; Educational Facilities; Elementary Education; *Environmental Education; Natural Resources; Natural Sciences; *Partnerships in Education; *Professional Development; Public Relations; Public Service Occupations; Public Support

ABSTRACT

While natural resource professionals are adept at managing resources, they often lack the skills and desire to work effectively with the public. School-based partnerships are a potential vehicle for enhancing social interaction skills. Research shows that teachers benefit from partnerships but the benefits of partnering for the resource professionals are unknown. This qualitative study explored how the skills and competencies identified as "essential" in the workplace were impacted for resource professionals engaged in partnerships. The results of the interviews suggest that professional development did indeed occur for natural resource professionals as a result of participating in active partnerships with elementary school teachers. Professional development was greatest in subcategories related to social interactions such as interpersonal skills, personal qualities, thinking and basic skills, and managing resources and information. These enhanced job-related skills and competencies led to resource professionals who perform their jobs with more confidence and initiative, greater thinking and reflective abilities, and more enthusiasm and a greater sense of purpose. Resource professionals were also made more aware of what the agency had to offer to the public. They came to value the education/public service mission of the agency more highly, especially service to children. Contains 12 references. (Author/PVD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 412 118

Professional Development of Environmental Educators through Partnerships

Presented by:

Deborah L. Bainer
Associate Professor, The Ohio State University, Mansfield
1680 University Drive
Mansfield, OH 44906
(419) 755-4287
Email: bainer.1@osu.edu

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
D.L. Bainer
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Diane Cantrell
Deputy Chief, Ohio Department of Natural Resources

Pat Barron
Executive Director, Science and Mathematics Network of Central Ohio

(Please address all correspondence regarding this manuscript to Bainer)

Paper presented at the annual meeting of the North American Association for Environmental Education, Vancouver, British Columbia, Canada, August 15-19, 1997.

SE060673

These programs, Partnering for Elementary Environmental Science and Sciencing with Watersheds, Environmental Education and Partnerships (SWEEP), were funded by the Dwight D. Eisenhower Program for Science and Mathematics Education administered by the U.S. Department of Education and the Ohio Board of Regents.

BEST COPY AVAILABLE

Abstract

While natural resource professionals are adept at managing resources, they often lack the skills and desire to work effectively with the public. School-based partnerships are a potential vehicle for enhancing social interaction skills. Research shows that teachers benefit from partnerships, but the benefits of partnering for the resource professionals are unknown. This qualitative study explored how the skills and competencies identified as "essential" in the workplace were impacted for resource professionals engaged in partnerships. Widespread development was self-reported during interviews, especially in interpersonal skills and personal qualities, thinking and basic skills, and managing resources and information.

Professional Development of Environmental Educators through Partnerships

Each year, millions of people call upon natural resources professionals to meet a variety of needs including recreation, land use, wildlife management, water use and safety, mineral rights, conflict resolution, and education. Unfortunately, according to Magill (1992), while natural resources professionals are well trained to care for resources and to address many of these resource-related needs, many of these professionals have "serious problems with serving people" (p. 6).

Magill (1992) found that too often persons trained to manage forests, forage, wildlife, water, minerals, and recreation areas are either not trained or minimally trained as well as psychologically disinclined to understand and manage social interactions. Why is this? Natural resources professionals are generally oriented toward the production and management of concrete things, such as trees and water, rather than toward the management of people (Lee & Rosenberg, 1978; Wagar, 1975). As a result, they are more inclined toward concrete responsibilities, such as protecting and conserving natural resources, than they are toward serving public needs involving abstract issues, activities, and concepts. The situation is aggravated by the fact that natural resources professionals are simply not trained during their academic programs to recognize or manage the types of social situations which they encounter (Magill, 1992). Further, even if new hires are equipped with better communications skills and sensitivity toward the public, they tend not to be accepted by the continuing "groupthink" (Janis, 1971) perspective of the natural resources professionals already employed.

In times of political uncertainty and fiscal cutbacks, natural resources professionals need the support of the public. More than ever, garnering public support is an essential skill for natural resource professionals. Effectively serving the public requires

understanding who they are, what they are seeking, and how to communicate with them as well as an orientation toward interacting with people. This service function, however, may be hampered by the background and training of a majority of natural resources professionals (Magill, 1992). More academic work in resources is unlikely to improve their abilities to interact with the public. The need is for professional development in social sciences and communication skills.

Partnerships between schools and natural resources agencies have been advocated as a promising vehicle for the professional development of both teachers and natural resources professionals. Indeed, teachers involved in long-term partnerships with natural resources professionals demonstrate more knowledge of environmental science and greater confidence in that knowledge and in their ability to teach environmental science effectively (Bainer, Barron, & Cantrell, 1995; Bainer & Williams, 1996).

Good partnerships can provide benefits for natural resources professionals and their agencies as well. Agencies can provide financial support through small grants, share human resources, and provide role models for students. Schools provide agency partners with ways to fulfill their social goals and responsibilities, improve their image in the community, and influence the skills and knowledge of potential employees (Hall, Castrale, & Zimmerman, 1993). Further, partnerships with schools enable resource professionals to learn about the obstacles to improving education in America's classrooms, to better understand the roles and responsibilities of today's educators, and to recognize how to best apply their varied talents toward creating lasting change (Alberts & Toomi, 1995). Interaction with educators and students has been shown to enhance resource professionals' communication skills, provide them with a new way of looking at and processing job-related information, and offer challenges and stimulation at critical times during their careers (Bainer, Barron, & Cantrell, 1995; Bainer, Halon, & Williams, 1996; Halon & Bainer, 1996).

While some research has been conducted to investigate the benefits of

partnerships for teachers and to assess their impact on classroom instruction, little research has documented the specific impact of school-based partnerships on the natural resources professionals engaged in those group efforts. Because of the commitment of time, human, and material resources required by partnering, it is important to understand what impact, if any, the partnership has on the professional development of the agency partners involved. Moreso, it is important to determine if partnerships can provide professional development to enable resource professionals to better understand, interact with, and serve the public.

Methodology

This paper presents the results of efforts to better understand the impact of school-based partnerships on the professional development of natural resource professionals. The partnership teams were formed as part of two professional development programs, Partnering for Elementary Environmental Science (PEES) and Sciencing with Watersheds, Environmental Education and Partnerships (SWEEP), funded over a period of five years by the Dwight D. Eisenhower Program for Science and Mathematics Education administered by the U.S. Department of Education and the Ohio Board of Regents. The programs pair natural resource professionals with elementary teachers for long-term partnering efforts (at least one year) aimed at improving skills in using inquiry environmental science, developing thematic units centered on environmental science topics, and building collaborative networks within and beyond the partnership (Bainer, Barron, & Cantrell, 1996/97). While the primary target of the funded programs is to bring about professional development in science education for classroom teachers, it was hoped that resource professionals would also benefit from their interaction with and observation of teachers and their students.

Sample. This study represents an exploratory qualitative study of 73 natural resources professionals who have participated in elementary school-based partnerships for one to four years in one Midwestern state. A purposive sample was identified from among the resource professionals representing approximately ten percent of the population.

Individuals were selected to participate in the study based on the ease with which they articulated their partnership involvement and if the project directors deemed their partnership to be "good" or "active." Further, a balance of male and female participants with varied job descriptions were selected.

Seven resource professionals, four females and three males, participated in the study. Five worked for the state Department of Natural Resources (divisions of mining and reclamation, forestry, wildlife, real estate and land management, and soil and water conservation) and two worked for county resource agencies (soil and water conservation district and office of litter and recycling). Of the seven, three had public education as the primary focus of their job (at least 75%) while two others had education as a minor part of their job description. Two held jobs unrelated to education or public relations.

Partnership teams were involved in fifteen elementary school classrooms, including ten primary classes (grades 1,2,3) and five intermediate classes (grades 4,5,6). Although the partnership teams ranged in size from two members (one teacher and one resource professional) to eight members (four teachers and four resource professionals), the desired configuration for the program was up to three teachers paired with one resource professional. Four of the seven teams were engaged in partnerships of this size. Teams were engaged in partnering for one to four years with an average of 2.3 years in existence. Participants related their partnerships as "active" (three teams, 42.8%) or "very active" (four teams, 57.2%). All participants were either "satisfied" (two participants, 28.6%) or "highly satisfied" (five participants, 71.4%) with their partnering experience, and all seven resource professionals interviewed stated that "yes, definitely" they would recommend partnering to their colleagues and agency.

Interview. In order to investigate the impact of partnering on the professional development of resource professionals, the Secretary's Commission on Achieving Necessary Skills (SCANS) report, produced by the US. Department of Labor, was utilized as a standard. The report, What work requires of schools: A SCANS report for America

2000 (US. Department of Labor, 1991), identified a set of common competencies and foundational skills shared by all workers. These "lie at the heart of job performance today" (p. vi) and "will define effective work performance for the year 2000" (p. 7). These five competencies and three skills for workplace know-how from the SCANS report are presented in Table 1.

==========

Table 1

==========

The researchers reviewed the operational definitions and examples of the skills and competencies presented in the SCANS report. Given an understanding of school-based partnerships, categories and subcategories were identified which were deemed as most likely to have been impacted by participation in a partnership. The study was thus delimited to an investigation of three competencies (resources, interpersonal, and information) and three foundational skills (basic skills, thinking skills, and personal qualities) cited by the SCANS report. The 6 categories and 25 subcategories of skills and competencies used for this study are presented and operationally defined, based on definitions contained in the SCANS report, in Table 2.

==========

Table 2

==========

Resource professionals selected to participate in this study were contacted by letter and sent a copy of Table 2. They were informed that the purpose of the study was to identify if these job-related skills were impacted by engaging in a partnership. Participants were urged to consider the skills and competencies on the table and to note examples of how these skills had been impacted, either positively or negatively, by the partnership experience. Telephone interviews approximately 45 minutes in length were set up for each participant within a two week period in mid-August. Interviews were randomly assigned

to be conducted by each of the three researchers.

The telephone interview contained two parts. First, demographic information was collected, including a description of the participant's job title and responsibilities, characteristics of their partnership, and their satisfaction with partnering. Second, participants were interviewed regarding the SCANS skills and competencies. Participants were asked to self-report a ranking of how much, if at all, each skill or competency had been impacted ("decreased skill or competency," "no impact or change," "minimal improvement," "noticeable enhancement," or "very significant enhancement of the skill or competency"). Participants were then probed to explain how their skill in this area had changed and to attribute that change to some aspect of the partnering experience. Detailed notes were kept by interviewers, and immediately following each interview the notes were transcribed into a standard format for analysis. Self-reports of the magnitude of the impact were coded numerically (-1 = "decreased skill or competency" through +3 = "very significant enhancement"). Frequencies, means, and magnitudes were calculated for the numeric data and were presented on a spreadsheet.

Interview data was content analyzed by the research team to provide a fuller understanding of the professional development reported by the resource professionals. First, the spreadsheets containing numeric self-reports of change in each skill and competency were examined to identify subcategories which seemed most impacted by the partnership experience. The frequency of change within each subcategory was determined by totaling the number of resource professionals who indicated change, either positive or negative, for that skill or competency. The magnitude of change for the group was determined by adding the numeric ratings of change self-reported by the resource professionals, then deriving the mean of each subcategory score. Both the frequency and the magnitude within each category were examined and used as a basis for determining where participants perceived the most change in job-related skills. A mean score greater than 1.0 for magnitude indicated at least minimal improvement in that subcategory. The

categories and subcategories were further investigated in the interview transcripts by the researchers to better understand the exact nature of the change and learn to what aspect of partnering it was attributable.

Results

Natural resource professionals testified to professional growth in all 25 of the subcategories of skills and competencies. Further, in 16 of the 25 skills and competencies investigated in this study (64.0%), resource professionals self-reported more than minimal (X>1.0) growth.

Table 3 shows the magnitude of change and mean scores reported for the 12 subcategories of the three job-related competencies. Mean scores indicate that the greatest enhancement was evident in the category of Interpersonal competencies, especially "participates as a member of a team" (X = 1.6), "teaches others" (X = 1.4), and "serves clients/customers" (X = 1.3). Enhanced competence in the Resources category, especially "time" (X = 1.0) and "materials and resources" (X = 1.3), and in the Information category, especially "acquiring and evaluating information" (X = 1.0) and "interpreting and communicating information" (X = 1.1), were also noted. All of these mean values suggest self-reports of minimal (1.0) to noticeable (2.0) improvement in the competency.

==========

Table 3

==========

Similarly, natural resource professionals attested to professional development for all 13 subcategories of the Foundational Skills. Mean scores on Table 4 show often stronger than minimal change in these skills. The greatest growth was in the Thinking Skills category, with "creative thinking" (X = 1.9), "knowing how to learn" (X = 1.4), "problem-solving" (X = 1.1), and "decision-making" (X = 1.0) subcategories showing the greatest change. Personal Qualities also showed impressive gains, notably "self-esteem" (X = 1.9) and "self-management" (X = 1.1). Further, three of the four subcategories in

Basic Skills showed growth, specifically "speaking" (X = 1.7), "listening" (X = 1.3), and "writing" (X = 1.0).

==========

Table 4

==========

Content analysis of the interviews suggested five general areas or themes of professional development in the resource professionals' job-related skills and competencies. These general areas transcend the categories outlined in the SCANS report. Each is discussed below.

One area of obvious change or professional development was in the resource professionals' knowledge of and ability to work within the agency. Self-reported comments suggest that they are better, more effective employees. They are better workers; their job-related skills and competencies have improved as a result of partnering and they are, as a result, different in the way they perform their jobs. While they previously worked hard, they are now more able to "work smart." Specifically, participants testified that their understanding of and networking within the agency has improved. Because they needed to identify resources for use in their partnerships, they were "forced" to explore materials and resources available within the agency which they "never bothered to take advantage of before." As a result, they got to know the agency and its many divisions better. Generally, they were "inspired" and "impressed" by the number of resources available of which they were previously unaware. In many cases, this exploration led to better on-going networking within the agency. In some cases, this exploration led to a better understanding of the individuals' job responsibilities and place within the agency, as one resource professional shared:

> I'm getting a better hold on things here at work because through the partnership I've learned the importance of asking questions. In the schools it is okay to ask questions. I'm now confident enough to ask

where I didn't used to be. I used to feel guilty if I asked about things that I thought I should know the answer to. Not anymore.

Resource professionals also became better, smarter employees because of the education training the partnership experience provided, which seemed to fill a gap in their academic training. Resource professionals shared that as a result of partnering they learned and understood many things about effective education and the way people learn; information of which they were previously unaware. Because many of the resource professionals interviewed for this study have education-related responsibilities as a focus of their job, these new insights were directly transferable to similar projects and programs in the workplace. They attested to taking resources, materials, and skills from the classroom experience back to the job and of maximizing those with their many education-related responsibilities. One resource professional shared that "all year the wheels were always turning and I kept thinking, 'what can I take back to my job?'"

With the increased responsibilities of participating in a long-term partnership, many resource professionals faced new challenges related to time use and management. Numerous participants shared that they now more effectively manage time and are better able to identify responsibilities, prioritize tasks, and structure and organize their time at work. One respondent shared that:

> Time was something I needed to work on. Because of having to manage it in the partnership I have forced myself to manage it at work.

Additionally, resource professionals are more effective on the job because of enhanced organizational skills. Because the partnership brought them more things to be accountable for, they are more aware of the importance of being well organized. They attested to being more efficient at acquiring materials related to their job, to organizing those materials, and to generally being more organized on the job because of the partnering experience.

The second theme or area of professional development went beyond the

resource professionals' enhanced abilities to perform their jobs, and suggested that they are now a different kind of employee. They are thinking about themselves and about their jobs differently as a result of the partnering experience. They are participating in a different way within the agency as a result of the partnership, and this provides many benefits for the agency as a whole. Perhaps most obviously, the agencies benefited from increased visibility due to the participation of resource professionals in the partnerships. They are more widely recognized in school and community populations where it is often difficult to gain a foothold. Throughout the partnership program, resource professionals have been quick to point out the advantage of this exposure for their agency and the importance of the agency supporting the partnering effort; otherwise their ability to partner would be "crippled."

Less obvious, perhaps, but important is the fact that the resource professionals have been changed by the professional development provided by the partnering experience. Almost all participants attest to being more confident, a trait which has carried into the office and often into their personal lives. They have more confidence in their ability to get things done and to address problems at work. Relatedly, they are more decisive, more responsible, and more assertive. Within the agency, they say that they express their ideas more freely and exercise more leadership than before engaging in partnering. They take more initiative and are better able to distribute work within their departments or work groups. One of the areas of professional development in which the partnering experience provided directly transferable skills was in creative thinking and problem solving. Many resource professionals reported that problem solving started early in the partnership experience by "bouncing ideas off of each other to see if they would work." Throughout the year, many situations arose which led them through the problem solving process as a team: sitting down together and identifying the problem, considering alternative solutions, discussing possible ramifications, deciding on a course of action, and revisiting or evaluating that decision. Going through this process was "good practice for similar

situations on the job." As one resource professional observed,

> Creativity and problem solving are things that need to be exercised. The partnership gave me a chance to exercise these. Every time I did it stimulated my own process, which helps me on the job when problems arise.

Another resource person reported tremendous growth in her ability to approach and solve problems as a result of the partnership:

> Partnering has opened my eyes to being flexible. I look at things with less tunnel vision than I used to. I see different ways of solving problems. I see the process not just the end product. For example, I gave a workshop and had planned to be outside. It rained. altered my plans within ten minutes and adjusted. In the past, I would have lost it. I couldn't handle things not running my way. I attribute this to working with teachers in the partnership.

Areas of thinking other than problem solving and creativity have been impacted by partnering, making the resource professionals more reflective in general. Some have become more self-monitoring. That is, given feedback they can assess their own skills and performance and turn around and make necessary changes. "Now I make a concentrated effort and think, 'how can I do things differently?'" one resource professional shared. Another added that partnering gave "a path to follow" to becoming more self-managed and responsible in the workplace. Coupled with skills in long-range planning which were learned from the partnership experience, many resource professionals feel better able to direct the quality of their workplace performance. "Knowing the process of learning," one person shared, "causes you to be open to your own learning and the learning of your co-workers." Two of the seven resource professionals shared that the partnership led them to think more deeply, analytically, and reflectively about their job. During a period of

reorganization, they were required to value and prioritize their job responsibilities. One shared:

> During a review, I needed to explain my job. I used process skills learned from the partnership to analyze my job responsibilities and then to communicate them to management in an effective way.

These more confident, reflective resource professionals are an especially valuable resource in divisions which are moving toward a teaming concept. Some shared that they tended to team with others anyway and others said that their jobs provided little opportunity for them to use their newly acquired teaming skills. Others, however, shared that the transition to teaming in the workplace was easy because of the partnership experience. Some resource professionals told of being cooperative in the past, but now being able to make a greater contribution to the team because they are more confident and know how to share their ideas, "even if they aren't the best -- it's okay." Others realized the "interconnectedness" of teaming efforts and realized the steps necessary to build an effective team effort as a result of their partnership and easily transferred these skills and information to their workplace.

Of all the subcategories examined for this study, perhaps the most pronounced way in which these employees were different was in their sense of efficacy and purpose as a result of partnering. Resource professionals truly enjoyed the partnering experience and the time spent with schoolchildren: "I look forward to going out to the school. It's a nice change from pushing papers." But it provided the professionals with more than a break. It increased their sense of efficacy and their belief in their abilities. It stimulated them, and provided them with a fresh outlook on their job, as the following two professionals shared.

> As far as the effects on me at the workplace, it has refreshed me. I have a new enthusiasm for my job. I can stand back and say, hey, much of what I do may seem routine and office-like, but I also took students to a quarry or planted trees with them. We

are providing enrichment and this enthusiasm carries back with me to the office.

When I participate in (partnership) programs, I feel good about it. I'm upbeat and it carries through at work. I just feel more enthusiastic toward tasks at work that I might not otherwise feel upbeat about.

Some resource professionals cited incidents in which this renewal and enthusiasm spread to others in the workplace who visited the classrooms as guest speakers or resources. Others shared that their personal lives had also been enriched as a result of partnering, and that members of the partnership moved beyond a working relationship to become friends. Further, some resource professionals expressed an increased sense of commitment for their job as a result of partnering. This was true for at least one "teacher wanna be" who now realized some of her personal desires and needs through the job-related partnering experience. Others gained a renewed sense of the value and impact of the education-related work which was part of their job description. One poignant illustration:

I always felt that children were just children. The partnership elevated my understanding of their value so that now I see them as equal in importance to adults.

As a result, this resource person feels a greater sense of mission and the importance of his education-related work. Many expressed feeling good about the impact they were obviously having on children, as the following two quotes illustrate:

You're the hero at the school and it makes you feel good about yourself, especially when you see the impact you're having on kids. You can't always think of what you're getting out of it (i.e., partnering or any endeavor). It's fulfilling to know that you're benefiting others. That's the most fulfillment I've gained -- to

see that we're helping to improve environmental education in the schools.

A third theme related to professional development of the natural resource professionals reported was changes in their interactions with others in the workplace. Resource professionals interviewed for this study reported becoming more sensitive toward others in the workplace and to thinking more about satisfying the expectations of others. Several comments suggested that this is because they view their relationship with others in the workplace differently, as one quote points out:

> I have always tried to be responsible but after the partnership experience I look at it differently. If I don't live up to my responsibility, it has a huge impact on others.

Many shared that they are more empathetic at work, including more easily showing that they care. After working with so many types of students from such diverse backgrounds, many resource people found it easier to work with different types of people in the workplace. One resource professional told of overcoming existing "alienation" across divisions by using the teaming skills gained from the partnership. Another shared that interacting with teachers carried over into other workplace relationships. Through the partnership, he was learning to work with women with whom "I hadn't been used to communicating before." In several instances, resource professionals reported enhanced ability to interact and communicate with their bosses, which began by communicating about the partnership program.

Improved ability to listen to others and to read nonverbal cues as a result of the partnership were cited specifically as reasons for enhanced interaction skills in the workplace. While some resource people approached the partnership classrooms thinking they knew what was needed and how to deliver it, they quickly learned to "step back and listen" to what teachers, students, and administrators were saying through words and nonverbal reactions. As one professional shared:

> I think I have learned to listen for signs that I may not be 'getting through' with people in the workplace as a result of watching kids in the classroom. I listen and adjust better now.

A fourth theme of professional development among the resource professionals was enhanced articulation and communication skills. Some resource professionals shared being more clear in their writing as a result of working with young people who had little or no prior background in the topics which they work with daily. More frequently, resource professionals shared having their presentation or public speaking style impacted by the partnering experience. Many shared having learned from teachers to be more creative in finding ways to interest their audience. As a result, they incorporated more variety, such as multimedia, pictures, types of questions, and process skills, into their workplace presentation style. They also began to think more clearly and in advance about their presentations, making more conscious decisions about how to speak and lead groups effectively.

Because of their increased classroom experience through the partnership, many resource people claimed that they are more comfortable making presentations in front of adults. Increased opportunities to speak in front of people and to communicate ideas increased their confidence in doing these things in the workplace, as the following quote shows:

> I never was comfortable speaking in front of groups; I'm shy. After the partnering experience, I really have gained confidence in public speaking. This comes out at meetings (in the workplace).

The partnering experience demanded listening, discussion, and conversation in which "you had to choose your words wisely in order to communicate with others in the group." This has translated into the workplace throughout the year for many of the resource professionals who were interviewed. Further, they report being better able to "capture what people are able to understand and to deliver it to them" in the workplace, especially

using the inductive approaches learned during the partnering experience.

The fifth theme of professional development or change noted from the interviews with the resource professionals was change in the way they serve the public, their clients. The partnership experience taught some of the resource professionals to evaluate people and situations differently; to be able to determine their needs, desires, and problems. They could then better understand what assistance the clients seek from their agencies and better relate to the kinds of things which those clients, mainly teachers, need. More specifically, partnering taught them to look at school presentations the way educators view them and to better understand the thinking and needs of teachers and the constraints of the classroom. Because of this client perspective, they could better organize their thoughts and develop experiences and ideas centered on the district course of study and the overall objectives which the teachers need to accomplish. Many resource professionals cited changes in the way they present information to both children and adults, about thinking more about the way they relate to any audience, and about their newfound ability to adjust information to a level that any audience can understand. They now consider different learning styles of audiences when speaking or teaching. They are more comfortable working with youth "regardless of their attitude" and are able to manage groups of young people to avoid disruptions. Also, they are better able to communicate with teachers and other clients. Finally, resource professionals self-report that they now provide services for a wider range of clients. They are providing workshops and making presentations which they "never would have attempted prior to partnering."

Discussion and Summary

The results of these interviews suggest that professional development did indeed occur for natural resource professionals as a result of participating in active partnerships. The impact of the development was widespread. For all 25 subcategories of foundational skills and competencies identified as essential to success in the workplace by the SCANS report (1991), at least one person interviewed attested to growth. Further, in 16 of the 25

subcategories (64.0%), the magnitude of self-reported change indicates that more than minimal growth occurred in the participants. Professional development was greatest in subcategories related to social interactions: interpersonal skills, personal qualities, thinking and basic skills, and managing resources and information. These enhanced job-related skills and competencies led to resource professionals who are more effective at performing their jobs, but also who are a different kind of employee. They provide benefits to the agency by completing their jobs with more confidence and initiative, greater thinking and reflective abilities, and more enthusiasm and a greater sense of purpose.

Perhaps more important, the partnering experience seems to provide professional development for natural resources professionals in the areas of concern to Magill (1992) and others. Specifically, resource professionals were made more aware of what the agency had to offer to the public. They came to value the education/public service mission of the agency more highly, especially service to children. They developed greater sensitivity for others, a better understanding of people, and a willingness to listen to and to work with them whether in the workplace or in the general public. They are better able to communicate with clients and to effectively use communication strategies to provide natural resources experiences that are responsive to the public's desires and concerns, yet effective in presenting a conservation ethic. When conflicts arise in the workplace or in society, they are better able to manage people toward solving problems through teaming efforts.

The impact of the partnering experience needs further investigation in order to be fully understood. Not surprisingly, resource professionals with job responsibilities related to public education and information seemed to benefit the most from the partnering experience. Specific benefits for professionals in other divisions of the agencies need to be more closely examined to learn more about their professional development experience. This may require a larger sample and longer interviews. A series of interviews could more carefully explore and delineate the workplace skills embedded within each subcategory of the SCANS skills and competencies. In addition, participants should be probed for skills

and competencies in which they experienced growth but which they currently have no opportunity to exhibit in the workplace. That is, potential as well as actual growth should be explored to assess the full impact of the partnering experience. Finally, it must be remembered that the skills and competencies delineated by the SCANS report target entry-level positions within businesses and agencies. As such, one might expect minimal change, if any, to be reported by experienced professionals. The scale might not be entirely appropriate nor sensitive enough to measure the change in experienced professionals such as those engaged in this study.

Several caveats must be noted when interpreting the numeric data. First, it was apparent from the interviews that the categories and subcategories were confusing to many participants, even with operational definitions. Participants tended to focus on the traditional meaning of the title of some subcategory (such as reading or writing) with little regard for the somewhat nontraditional delineation of the skills in that area. Further, participants tended to focus on one or two of the many skills delineated in the definition of each subcategory, to assign a numeric rating, and to expound solely on that particular aspect of the subcategory. Second, the numeric data may reflect variables other than actual change in each subcategory. That is, the degree of change self-reported by the participants may reflect personality, gender, or other factors not investigated in this study. For example, more emotionally reactive individuals may routinely assign higher numbers to subcategories than other individuals. Third, it was sometimes difficult for participants to self-report change and assign numeric codes because the subcategories are not mutually exclusive, even with the operational definitions. Indeed, the SCANS report states that the skills and competencies are "highly integrated" and that "most tasks require workers to draw on them simultaneously" (1991, p. vi).

Nevertheless, this exploratory study suggests that school-based partnerships do stimulate professional development in natural resources professionals, especially in social and interaction skills, management of people and resources, and personal confidence and

service-orientation. Further, agencies benefit from increased access to the public and positive exposure because of their involvement with teachers in long-term partnership efforts. It seems, then, that natural resource agencies should seek out or create opportunities for school-based partnerships in their areas for the good of the schools, the public, their employees, and the agencies themselves.

Table 1: Competencies and Foundational Skills Identified by the SCANS Report (1991)

Workplace Know-how

The know-how identified by SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance. These include:

COMPETENCIES -- effective workers can productively use:

* **Resources** -- allocating time, money, materials, space, and staff

* **Interpersonal Skills** -- working on teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds;

* **Information** -- acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information;

* **Systems** -- understanding social, organizational and technological systems, monitoring and correcting performance, and designing or improving systems;

* **Technology** -- selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.

THE FOUNDATION --competence requires:

* **Basic Skills** -- reading, writing, arithmetic and mathematics, speaking, and listening;

* **Thinking Skills** -- thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn and reasoning;

* **Personal Qualities** -- individual responsibility, self-esteem, sociability, self-management, and integrity.

Table 2: Modified SCANS Competencies and Skills Used in Study

---

SCANS Report on Workplace Know-How

The know-how identified by SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance. We are interested in your perception of how, if at all, your use of these skills and competencies in the workplace has been impacted by your partnering experience. Please make notes to yourself to illustrate your thinking or reaction to your experience. It would be helpful if you could specify how partnering has impacted your competencies and skills in each area: i.e., decreased skill or competency, no impact or change, minimal improvement, notable enhancement, very significant enhancement of skill or competency.

COMPETENCIES

1. Resources - Identifies, organizes, plans and allocates resources

A. Time - Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules

B. Material and Facilities - Acquires, stores, allocates, and uses materials or space efficiently

C. Human Resources - Assesses skills and distributes work accordingly, evaluates performance and provides feedback

2. Interpersonal: Works with Others

A. Participates as Member of a Team - Works cooperatively with others and contributes to group with ideas, suggestions, and effort

B. Teachers Others - Helps others learn

C. Serves Clients/Customers - Works and communicates with clients and customers to satisfy their expectations

---

table continues

Table 2 cont.

D. Exercises Leadership - Communicates thoughts, feelings, and ideas to justify a position, encourages, persuades, convinces or otherwise motivates an individual or groups, including responsibly challenging existing procedures, policies, or authority

E. Negotiates - Works towards an agreement that may involve exchanging specific resources or resolving divergent interests

F. Works with Cultural Diversity - Works well with men and women with a variety of ethnic, social, or educational backgrounds

3. Information - Acquires and Uses Information

A. Acquires and Evaluates Information - Identifies need for data, obtains it from existing sources or creates it and evaluates its relevance and accuracy

B. Organizes and Maintains Information - Organizes, processes, and maintains written or computerize records and other forms of information in systematic fashion

C. Interprets and Communicates Information - Selects and analyzes information and communicates the results to others using oral, written, graphic, pictorial, or multi-media methods

FOUNDATIONAL SKILLS

1. Basic Skills

A. Reading - Locates, understands, and interprets written information in prose and documents to perform tasks; learns from text by determining the main idea or essential message; identifies relevant details, facts, and specifications; infers or

(table continues)

Table 2, cont.

locates the meaning of unknown or technical vocabulary; judges the accuracy, appropriateness, style, and plausibility of reports, proposals, or theories of other writers

B. Writing - Communicates thoughts, ideas, information, and messages in writing; composes and creates documents such as letters, directions, manuals, reports, proposals, graphs, flow charts; uses language, style, organization, and format appropriate to the subject matter, purpose, and audience

C. Listening - Receives, attends to, interprets, and responds to verbal messages and other cues such as body language in ways that are appropriate to the purpose

D. Speaking - Organizes ideas and communicates oral messages appropriate to listeners and situations; participates in conversation, discussion, and group presentations; selects an appropriate medium for conveying a message; uses verbal language and other cues such as body language appropriate in style, tone, and level of complexity to the audience and the occasion; speaks clearly and communicates a message; understands and responds to listener feedback; and asks questions when needed

2. Thinking Skills

A. Creative Thinking - Uses imagination freely, combines ideas or information in new ways, makes connections between seemingly unrelated ideas, and reshapes goals in ways that reveal new possibilities

B. Decision Making - Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternatives

C. Problem Solving - Recognizes that a problem exists, identifies possible reasons for the problem, and devises and implements a plan of action to resolve it; Evaluates and monitors progress and revises plan as indicated by findings

(table continues)

Table 2, cont.

D. Knowing How to Learn - Recognizes and can use learning techniques to apply and adapt new knowledge and skills in both familiar and changing situations

E. Reasoning - Discovers a rule or principle underlying the relationship between two or more objects and applies it in solving a problem

3. Personal Qualities

A. Responsibility - Exerts high level of effort and perseverance; works hard at setting high standards and paying attention to details, working well, and displaying high level of concentration even when assigned an unpleasant task; displays enthusiasm, vitality, punctuality, and optimism in approaching and completing tasks

B. Self-Esteem - Believes in own self-worth and maintains a positive view of self; demonstrates knowledge of own skills and abilities; is aware of impact on others; knows own emotional capacity and needs and how to address them

C. Sociability - Demonstrates understanding, friendliness, adaptability, empathy, and politeness in new and on-going group settings; asserts self in familiar and unfamiliar social situations; relates well to others; responds appropriately as the situation requires; takes an interest in what others say and do

D. Self-Management - Assesses own knowledge, skills, and abilities accurately; sets well-defined and realistic personal goals; monitors progress toward goal attainment and motivates self through goal achievement; exhibits self-control and responds to feedback unemotionally and non defensively; is a "self-starter"

Table 3: Natural Resource Professionals' Self-Reports of Change in Job-related Competencies

Category	Participants Who Reported Change (n=7)	(%)	Magnitude of Change	Mean Change
Resources				
Time	3	43	7	1.0
Materials	5	70	9	1.3
Human resources	3	43	5	0.7
Interpersonal				
Teaming	6	86	11	1.6
Teaches others	6	86	10	1.4
Serves clients	4	57	9	1.3
Exercises leadership	4	57	6	0.9
Negotiates	3	43	5	0.7
Works with diversity	3	43	5	0.7
Information				
Acquires and evaluates	5	71	7	1.0
Organizes	5	71	6	0.8
Interprets and communicates	5	71	8	1.1

Table 4: Natural Resource Professionals' Self-reports of Change in Job-related Foundational Skills

Category	Participants Who Reported Change (n=7)	(%)	Magnitude of Change	Mean Change
Basic skills				
Reading	2	29	4	0.6
Writing	4	57	7	1.0
Listening	6	86	9	1.3
Speaking	6	86	12	1.7
Thinking skills				
Creative thinking	6	86	13	1.9
Decision making	4	57	7	1.0
Problem solving	6	86	8	1.1
Know how to learn	5	71	10	1.4
Reasoning	1	14	1	0.1
Personal Qualities				
Responsibility	3	43	6	0.8
Self-esteem	7	100	13	1.9
Sociability	5	29	5	0.7
Self-management	5	71	8	1.1

References

Alberts, B.M., & Toomi, J. (1995, Spring). Educating students for the 21st century. On Common Ground, 4. 6-7.

Bainer, D. L., Barron, P., & Cantrell, D. (1996/97). Enhancing science instruction in rural elementary schools through partnering. Rural Educator, 18 (2).

Bainer, D. L., Barron, P., & Cantrell, D. (1995). [The impact of reform-based partnerships on the professional development of resource professionals]. Unpublished raw data.

Bainer, D. L., Halon, C. S., & Williams, D. A. (1996, October). Professional development of natural resources professionals through school-based partnerships. In D. L. Bainer (Chair), Educating the professions through school-based partnerships. Symposium conducted at the annual meeting of the Mid-Western Educational Research Association, Chicago, IL.

Bainer, D. L., & Williams, D. A. (1996). Evaluating the effects of environmental science programs on teachers, students, and communities: Part II: Partnering for Elementary Environmental Science. Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education. (ERIC Document Reproduction Service No. ED 391 667).

Hall, R. F., Castrale, E. G., & Zimmerman, S. (1993). Business-education partnerships: Developing a collaborative relationship with business and community. Macomb, IL: Western Illinois University.

Halon, C. S., & Bainer, D. L. (1996, October). Professional development of business professionals through school-based partnerships. In D. L. Bainer (Chair), Educating the professions through school-based partnerships. Symposium conducted at the annual meeting of the Mid-Western Educational Research Association, Chicago, IL.

Janis, I. L. (1971). Groupthink. Psychology Today, 5, 43-46, 74-76.

Lee, R. G., & Rosenberg, K. (1978). Situated personological types: Thing-perso orientation in three natural resource majors. Unpublished manuscript, University of California, Department of Forestry and Conservation, Berkeley, CA.

Magill, A. W. (1992). Outdoor recreation careers: A need for socially sensitive people and training in the social sciences. Journal of Environmental Education,23(3), 4-8.

The Secretary's Commission on Achieving Necessary Skills, U. S. Department of Labor. (1991). What Work Requires of Schools A SCANS Report for America 2000. Washington, DC: U. S. Department of Labor.

Wagar, J. A. (1975, September). Forestry as a subculture: Do we really care about recreation? Presentation at the Recreation Working Group, National Meeting of the Society of American Foresters, Washington, D. C.